

DETAILED ACTION

Status of Claims

1. This is in response to the applicant's remarks filed on 12/07/2010.

Claims 27, 42 are amended by the examiner and claim 34 is canceled. Therefore, claims 27-33, 35-56 are presented for examination.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Aaron C. Deditch on 01/28/2011.

Claim 27:

A fire detector, for detecting smoke, comprising:

a first radiation transmitter and a first radiation receiver having a first beam path that forms a first scattering volume;

a second radiation transmitter and a second radiation receiver having a second beam path that is parallel to the first beam path and forms a second scattering volume, wherein the first scattering volume and the second scattering volume are spatially separated and do not overlap, wherein the first radiation transmitter and the second radiation transmitter are oriented by an angle of 180° from one another, and wherein the first radiation receiver and the second radiation receiver are oriented 180° from one another; and a microcomputer to selectably control the first radiation transmitter and the second radiation transmitter, the microcomputer analyzing the first scattering volume and the second scattering volume through an analog-to-digital converter.

Claim 42:

A method for operating a fire detector, the method comprising:

a second radiation transmitter and a second radiation receiver having a second beam path that is parallel to the first beam path and forms a second scattering volume, wherein the first scattering volume and the second scattering volume are spatially separated and do not overlap, wherein the first radiation transmitter and the second radiation transmitter are oriented by an angle of 180° from one another, and wherein the first radiation receiver and the second radiation receiver are oriented 180° from one another; checking the fire detector for operability; performing a function check of a set of transmitters and a set of receivers; obtaining scattered radiation measured values from two different scattering volumes formed from parallel beam paths of the set of transmitters and receivers; comparing the scattered radiation measured values to one another; inferring a presence of smoke and a source of fire if the scattered

radiation measured values are generally equal; determining a type, a size, a distance and a color of the smoke; and inferring a presence of an interfering body in a scattering volume if the scattered radiation measured values deviate from one another.

Allowable Subject Matter

1. Claims **27-33, 35-56** allowed.
2. The following is an examiner's statement of reasons for allowance:

Claim 27:

Schneider is drawn to a smoke detector based on the scattered-light principle. Schneider teaches a detector with an emitter and a receiver whose beams of emission and reception form an oblique angle and intersect in free space outside the detector body such that the intersection forms a scattering volume (figure 1). As a consequence of being able to sense smoke in free space, Schneider recites a detector that requires no optical labyrinth (Invention Background column 1). He further exhibits a processor 7 (figures 1 and 2) tied to transmitter control 5 which in turn is tied to light transmitter 3.

In a similar field of endeavor, Dolnick teaches an optical smoke detector system which has a first emitter-receiver combination and a second emitter-receiver combination (figure 1 and Invention Summary column 1). Dolnick further teaches wherein the scattering volumes 6 may be separate, i.e., spatially distinct, for each emitter-receiver combination (lines 42-44 column 2).

In an analogous art, Thuillard is directed to an optical smoke detector which can compensate for extraneous matter and thus prevent false alarms. He teaches that smoke is spatially homogeneous whereas foreign matter or objects are non-homogeneously distributed (column 2 lines 59-65). Thuillard exhibits multiple emitters and receivers (figures 1-4). In particular, he exhibits a first 7 and second radiation detector 8 diametrically opposed at 180 degrees (figure 2) (column 6 lines 36-37) as well as a first 2 and second radiation emitter 22 diametrically opposed at 180 degrees (figure 4) (column 7 lines 54-60).

Thuillard further exhibits a first and second beam emitted from sources 2 and 22 such that the beams are parallel (figure 5) and do not coincide (figure 5a).

In an analogous art, Politze is drawn to an optical smoke detector which takes the ratio of scatter readings from forward and backward angles and uses the ratio (reads on comparing scatter values to one another) as a means for determining the presence of smoke as well as inferring the type of smoke (column 2 lines 10-12 lines 16-25 lines 59-61).

However, none of the prior art discloses nor fairly suggests a second radiation transmitter and a second radiation receiver having a second beam path that is parallel to the first beam path and forms a second scattering volume, wherein the first scattering volume and the second scattering volume are spatially separated and do not overlap, wherein the first radiation transmitter and the second radiation transmitter are oriented by an angle of 180° from one another, and wherein the first radiation receiver and the second radiation receiver are oriented 180° from one another.

Claim 42:

Claim 42 is allowed for substantially the same reasons put forth in the discussion of claim 27.

Further, none of the prior art discloses nor fairly suggests a means of determining a type, a size, a distance and a color of the smoke; and inferring a presence of an interfering body in a scattering volume if the scattered radiation measured values deviate from one another.

Conclusion

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRADLEY E. THOMPSON whose telephone number is (571)270-5583. The examiner can normally be reached on M-F 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Bugg can be reached on 571-272-2998. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BRADLEY E THOMPSON
Examiner
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/BET/

/George A Bugg/
Supervisory Patent Examiner, Art Unit 2612